

## SEQUENCE LISTING

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MIZUNO, Hideaki

<120> FLUORESCENT PROTEIN AND CHROMOPROTEIN

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<141> 2005-02-23

<150> JP2002/243337  
<151> 2002-08-23

<150> JP2002/243338  
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<150> JP2002/274266  
<151> 2002-09-20

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<170> PatentIn version 3.3

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<213> Anthopleura inornata

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Gly Pro Leu Pro Phe Ala Tyr Asp Thr Leu Thr Pro Cys Trp Met Tyr  
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Gly Ser Lys Thr Phe Ile Lys His Thr Ser Gly Ile Pro Asp Tyr Phe  
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Glu Asp Gly Gly Cys Leu Thr Ile His Gln Asp Thr Ser Met Gln Gly  
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Asp Cys Phe Ile Phe Lys Ile Lys Val Ile Gly Thr Asn Phe Pro Ala  
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Asn Gly Pro Val Met Gln Lys Lys Thr Ala Gly Trp Glu Pro Cys Val  
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Glu Met Leu Tyr Pro Arg Ala Gly Val Leu Cys Gly Gln Ser Leu Met  
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Ala Leu Lys Cys Lys Asp Gly Asn His Leu Thr Cys His Leu Arg Thr  
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Thr Tyr Arg Ser Arg Lys Ala Gly Gln Lys Met Pro Glu Phe His Phe  
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Gly Asp His Arg Ile Glu Ile Leu Lys Glu Glu Glu Gln Gly Met Arg  
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Ile Glu Gln Tyr Glu Ala Ala Val Ala Arg Tyr Cys Glu Ala Pro Ser  
       210                          215                          220

Arg Leu Gly His His  
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Lys Pro Phe Glu Gly Tyr Gln Val Glu Lys Ile Arg Val Thr Glu Gly  
 35 40 45

Gly Pro Leu Pro Phe Ala Tyr Asp Ile Leu Ala Pro Cys Cys Ser Tyr  
 50 55 60

Gly Ser Lys Thr Phe Ile Lys His Val Ser Gly Ile Pro Asp Tyr Phe  
 65 70 75 80

Lys Glu Ser Phe Pro Glu Gly Phe Thr Trp Glu Arg Thr Gln Ile Tyr  
 85 90 95

Glu Asp Gly Gly Ser Leu Ser Ile His Gln Asp Thr Ser Leu Gln Gly  
 100 105 110

Asp Cys Phe Ile Tyr Lys Ile Lys Val Ile Gly Thr Asn Phe Pro Ala  
 115 120 125

Asn Gly Pro Val Met Gln Lys Lys Thr Ala Gly Trp Glu Pro Cys Val  
 130 135 140

Glu Met Leu Tyr Pro Arg Ala Gly Val Leu Cys Gly Gln Ser Leu Met  
 145 150 155 160

Ala Leu Lys Cys Lys Asp Gly Asn His Leu Thr Cys His Leu Arg Thr  
 165 170 175

Thr Tyr Arg Ser Arg Lys Ala Gly Gln Lys Met Pro Glu Phe His Phe  
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Gly Asp His Arg Ile Glu Ile Leu Lys Glu Glu Glu Gln Gly Met Arg  
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<212> PRT

<213> Trachyphyllia geoffroyi

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			20					25					30		

Pro	Phe	Glu	Gly	Lys	Gln	Ser	Met	Asp	Leu	Val	Val	Lys	Glu	Gly	Ala
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Pro	Leu	Pro	Phe	Ala	Tyr	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr	Gly
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Gln	Ser	Phe	Pro	Lys	Gly	Phe	Ser	Trp	Glu	Arg	Ser	Leu	Met	Phe	Glu
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Asp	Gly	Gly	Val	Cys	Ile	Ala	Thr	Asn	Asp	Ile	Thr	Leu	Lys	Gly	Asp
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Gly Pro Val Met Gln Lys Lys Thr Leu Lys Trp Glu Ala Ser Thr Glu  
 130 135 140

Lys Met Tyr Leu Arg Asp Gly Val Leu Thr Gly Asp Ile Thr Met Ala  
 145 150 155 160

Leu Leu Leu Lys Gly Asp Val His Tyr Arg Cys Asp Phe Arg Thr Thr  
 165 170 175

Tyr Lys Ser Arg Gln Glu Gly Val Lys Leu Pro Gly Tyr His Phe Val  
 180 185 190

Asp His Cys Ile Ser Ile Leu Arg His Asp Lys Asp Tyr Asn Glu Val  
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Lys Leu Tyr Glu His Ala Val Ala His Ser Gly Leu Pro Asp Asn Val  
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Lys  
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240

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&lt;211&gt; 225

&lt;212&gt; PRT

<213> *Trachyphyllia geoffroyi*

&lt;400&gt; 7

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Pro	Phe	Glu	Gly	Lys	Gln	Ser	Met	Asp	Leu	Val	Val	Lys	Glu	Gly	Ala
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Pro	Leu	Pro	Phe	Ala	Tyr	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr	Gly
	50					55					60				



Asn Arg Val Phe Ala Lys Tyr Pro Asp His Ile Pro Asp Tyr Phe Lys  
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Gln Ser Phe Pro Lys Gly Phe Ser Trp Glu Arg Ser Leu Met Phe Glu  
85 90 95

Asp Gly Gly Val Cys Ile Ala Thr Asn Asp Ile Thr Leu Lys Gly Asp  
100 105 110

Thr Phe Phe Asn Lys Val Arg Phe Asp Gly Val Asn Phe Pro Pro Asn  
115 120 125

Gly Pro Val Met Gln Lys Lys Thr Leu Lys Trp Glu Ala Ser Thr Glu  
130 135 140

Lys Met Tyr Leu Arg Asp Gly Val Leu Thr Gly Asp Ile Arg Met Glu  
145 150 155 160

Leu Leu Leu Lys Gly Asp Val His Tyr Arg Cys Asp Phe Arg Thr Thr  
165 170 175

Tyr Lys Ser Arg Gln Glu Gly Val Lys Leu Pro Gly Tyr His Phe Val  
180 185 190

Asp His Cys Ile Ser Ile Leu Arg His Asp Lys Asp Tyr Asn Glu Val  
195 200 205

Lys Leu Tyr Glu His Ala Val Ala His Ser Gly Leu Pro Asp Asn Val  
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Lys  
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<213> *Trachyphyllia geoffroyi*

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cagtcgtttc ccaaagggtt ttcttgggag cgaagcctga tggtcgagga cgggggcggt  
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<213> *Scolymia vitiensis*

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35 40 45

Gly Pro Leu Pro Phe Ala Tyr Asp Ile Leu Thr Thr Ala Phe His Tyr  
50 55 60

Gly Asn Arg Val Phe Ala Lys Tyr Pro Lys Asp Ile Pro Asn Tyr Phe  
65 70 75 80

Glu Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ile Phe  
85 90 95

Glu Asp Gly Gly Ile Cys Ile Ala Arg Asn Asp Ile Thr Met Asp Gly  
100 105 110

Gly Thr Phe Tyr Asn Lys Val Arg Phe Tyr Gly Val Asn Phe Pro Pro  
115 120 125

Asn Gly Pro Val Met Gln Lys Lys Thr Gln Lys Trp Glu Gln Ser Thr  
130 135 140

Glu Lys Met Tyr Ala Arg Asp Gly Val Leu Thr Gly Asp Ile Asn Met  
145 150 155 160

Ala Leu Leu Leu Lys Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr  
165 170 175

Thr Phe Lys Ala Lys Glu Lys Gly Val Lys Leu Pro Gly Tyr His Phe  
180 185 190

Ile Asp His Cys Ile Glu Ile Leu Ser His Arg Asn Asp Tyr Asn Asn  
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Val Thr Leu Phe Glu His Ala Val Ala Arg Ser Gly Leu Gln Asp Lys  
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Glu Lys Gln Gln Gln  
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Gly Pro Leu Pro Phe Ala Tyr Asp Ile Leu Thr Thr Ala Phe His Tyr  
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Gly Asn Arg Val Phe Ala Lys Tyr Pro Lys Asp Ile Pro Asn Tyr Phe  
65 70 75 80

Glu Gln Ser Phe Pro Lys Gly Tyr Ser Trp Glu Arg Ser Met Ile Phe  
85 90 95

Glu Asp Gly Gly Ile Cys Ile Ala Arg Asn Asp Ile Thr Met Glu Gly  
100 105 110

Gly Thr Phe Tyr Asn Lys Val Arg Phe Tyr Gly Val Asn Phe Pro Pro  
115 120 125

Asn Gly Pro Val Met Gln Lys Lys Thr Gln Lys Trp Glu Pro Ser Thr  
130 135 140

Glu Lys Met Tyr Ala Arg Asp Gly Val Leu Thr Gly Asp Ile Asn Met  
 145 150 155 160

Ala Leu Leu Leu Lys Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr  
 165 170 175

Thr Phe Lys Ala Lys Glu Lys Gly Val Lys Leu Pro Gly Tyr His Phe  
 180 185 190

Ile Asp His Cys Ile Glu Ile Leu Ser His His Asn Asp Tyr Asn Asn  
 195 200 205

Val Thr Leu Phe Glu His Ala Val Ala Arg Ser Gly Leu Gln Asp Lys  
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Glu Lys Gln Gln Gln  
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&lt;400&gt; 13

Met Val Ser Val Ile Lys Asp Glu Met Lys Val Asn Leu Arg Met Glu  
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Gly Ser Val Asn Gly His Asp Phe Val Ile Asp Gly Leu Gly Ser Gly  
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Lys Pro Lys Glu Gly Thr Gln Thr Ile Glu Leu Lys Val Val Lys Gly  
35 40 45

Gly Pro Leu Pro Phe Ala Tyr Asp Ile Leu Thr Thr Ala Phe His Tyr  
50 55 60

Gly Asn Arg Val Phe Ala Lys Tyr Pro Lys Asp Ile Pro Asn Tyr Phe  
65 70 75 80

Glu Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ile Phe  
85 90 95

Glu Asp Gly Gly Ile Cys Ile Ala Arg Asn Asp Ile Thr Met Asp Gly  
100 105 110

Gly Thr Phe Tyr Asn Lys Val Arg Phe Tyr Gly Val Asn Phe Pro Pro  
115 120 125

Asn Gly Pro Val Met Gln Lys Lys Thr Gln Lys Trp Glu Gln Ser Thr  
130 135 140

Glu Lys Met Tyr Ala Arg Asp Gly Val Leu Thr Gly Asp Ile Asn Met  
145 150 155 160

Ala Leu Leu Leu Lys Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr  
165 170 175

Thr Phe Lys Ala Lys Glu Lys Gly Val Lys Leu Pro Gly Tyr His Phe  
180 185 190

Ile Asp His Cys Met Glu Ile Leu Ser His Arg Asn Asp Tyr Asn Asn  
195 200 205

Val Thr Leu Phe Glu His Ala Val Ala Arg Ser Gly Leu Gln Asp Lys  
210 215 220

Glu Lys Gln Gln Gln  
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<213> Scolymia vitiensis

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120

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<213> Scolymia vitiensis

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Lys Pro Lys Glu Gly Thr Gln Thr Ile Glu Leu Lys Val Val Lys Gly  
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Gly Pro Leu Pro Phe Ala Tyr Asp Ile Leu Thr Thr Ala Phe His Tyr  
 50 55 60

Gly Asn Arg Val Phe Ala Lys Tyr Pro Lys Asp Ile Pro Asn Tyr Phe  
 65 70 75 80

Glu Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ile Phe  
 85 90 95

Glu Asp Gly Gly Ile Cys Ile Ala Arg Asn Asp Ile Thr Met Asp Gly  
 100 105 110

Gly Thr Phe Tyr Asn Lys Val Arg Phe Glu Gly Val Asn Phe Pro Pro  
 115 120 125

Asn Gly Pro Val Met Gln Lys Asn Thr Leu Lys Trp Glu Pro Ser Thr  
 130 135 140

Glu Lys Met Tyr Ala Arg Asp Gly Val Leu Thr Gly Asp Ile Asp Met  
 145 150 155 160

Ser Leu Leu Leu Lys Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr  
 165 170 175

Thr Phe Lys Ala Lys Glu Lys Gly Val Lys Leu Pro Gly Thr His Tyr  
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Ile Asp His Ser Ile Glu Ile Leu Ser His Arg Asn Asp Tyr Asn Asn  
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 aaggagaagg gtgtcaagtt gccaggcacc cactacatag atcacagcat agagatttta  
 600  
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 660  
 ttgcaggact aa  
 672

<210> 17  
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&lt;213&gt; Scolymia vitiensis

&lt;400&gt; 17

Met	Val	Ser	Val	Ile	Lys	Asp	Glu	Met	Lys	Val	Arg	Leu	Arg	Met	Glu
1				5					10					15	

Gly	Ser	Val	Asn	Gly	His	Asp	Phe	Val	Ile	Asp	Gly	Thr	Gly	Ser	Gly
			20					25					30		

Lys	Pro	Lys	Glu	Gly	Thr	Gln	Thr	Ile	Glu	Leu	Lys	Val	Val	Lys	Gly
		35					40					45			

Gly	Pro	Leu	Pro	Phe	Ala	Tyr	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr
	50					55					60				

Gly	Asn	Arg	Val	Phe	Ala	Lys	Tyr	Pro	Lys	Asp	Ile	Pro	Asn	Tyr	Phe
65					70					75					80

Glu	Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Thr	Phe
				85					90					95	

Glu	Asp	Gly	Gly	Val	Cys	Thr	Ala	Arg	Asn	Asp	Ile	Thr	Met	Asp	Gly
			100					105					110		

Gly	Thr	Phe	Tyr	Asn	Lys	Val	Arg	Phe	Glu	Gly	Thr	Asn	Phe	Pro	Pro
		115					120					125			

Asn	Gly	Pro	Val	Met	Gln	Lys	Lys	Thr	Leu	Lys	Trp	Glu	Pro	Ser	Thr
	130					135					140				

Glu	Lys	Met	Tyr	Ala	Arg	Asp	Gly	Val	Leu	Thr	Gly	Asp	Ile	Asp	Met
145					150					155					160

Ser	Leu	Leu	Leu	Lys	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Met	Arg	Thr
				165					170					175	

Thr Phe Lys Ala Lys Glu Lys Gly Val Lys Leu Pro Gly Thr His Tyr  
                   180                                  185                                  190

Ile Asp His Ser Ile Glu Ile Leu Ser His Arg Asn Asp Tyr Asn Asn  
                   195                                  200                                  205

Val Thr Leu Tyr Glu His Ala Val Ala Arg Ser Gly Leu Gln Asp  
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           120

attgagctta aagtcgtaaa ggggtggacct ttacctttcg cctacgatat cctgacaaca  
           180

gcattccatt acggcaaccg ggtattcgcc aaatacccaa aggatatacc aaactatttc  
           240

gagcagtcgt ttcttgaggg gtattcgtgg gaacggagca tgactttcga agacgggggc  
           300

gtttgcaccg ctagaaacga cataacaatg gatgggtggca ctttctataa taaagttcga  
           360

tttgaaggta caaatattccc cccaatggt ccagttatgc agaagaagac gctgaaatgg  
           420

gagccatcca ctgagaaaat gtatgcgcgt gatggagtgt tgacgggtga tattgacatg  
           480

tcctgtttgc ttaaaggggg tggccattac cgatgtgaca tgagaactac tttcaaagct  
           540

aaggagaagg gtgtcaagtt gccaggcacc cactacatag atcacagcat agagatttta  
           600

agccatcgca acgattacaa caacgttacg ctttatgagc atgctgttgc tcgttctgga  
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ttgcaggact aa  
672

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<220>  
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<220>  
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21

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<220>  
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<223> v is a, c, or g

<220>

<221> misc\_feature

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<223> d is a, g, or t

<220>

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<222> (11)..(11)

<223> y is c or t

<220>

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<222> (12)..(12)

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<220>

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<222> (14)..(14)

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<220>

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<222> (21)..(21)

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23

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33

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<220>  
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<222> (21)..(21)

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<212> DNA

<213> Artificial Sequence

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<223> primer

<400> 29

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<223> primer

<400> 30

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<210> 31

<211> 23

<212> DNA

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<400> 31

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23

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<213> Artificial Sequence

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<400> 33

cccggatccg accatggtga gtgtgattaa ggacgaaatg

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<223> primer

<400> 34

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33